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09/629,085	07/31/2000	Peter C. Damron	SUN-P4935	4971

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2188	

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/629,085	DAMRON, PETER C.	
	Examin r	Art Unit	
	Reginald G. Bragdon	2188	

-- The MAILING DATE of this communication appears on th cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-28,32 and 36* is/are rejected.

7)☒ Claim(s) *29-31 and 33-35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

2. The specification lacks antecedent basis for the term "program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine" as set forth in claim 8.

Claim Objections

3. Claims 2-7, 9-12, 14-18, 22-28, 32, and 35-36 are objected to because of the following informalities:

As per claim 2, line 3, "the first" should be --a first--.

As per claim 2, line 5, "processor" should be --processors--.

As per claim 3, line 3, "the second" should be --a second--.

As per claim 4, line 3, "the first" should be --a first--.

As per claim 6, line 3, "the second" should be --a second--.

As per claim 9, line 18, "the operation" should be --an operation--.

As per claim 10, line 3, delete "data".

As per claim 11, line 3, delete "data".

As per claim 12, line 16, "the operation" should be --an operation--.

As per claim 12, line 21, delete "data".

As per claim 14, line 3, delete "data".

As per claim 17, line 3, delete "data".

As per claim 18, line 3, delete "data".

As per claim 22, line 3, "the first" should be --a first--.

As per claim 23, line 3, "the second" should be --a second--.

As per claim 24, line 3, "the first" should be --a first--.

As per claim 26, line 3, "the second" should be --a second--.

As per claim 28, line 6, delete the period after "paths".

As per claim 28, line 7, "sanding" should be --sending--.

As per claim 32, line 3, "the second" should be --a second--.

As per claim 36, line 3, "the second" should be --a second--.

All dependent claims are objected to as having the same deficiencies as the claims they depend from.

Appropriate correction is required.

4. As per claims 20 and 23, line 1, Applicant has indicated that this claim is "Previously Presented" although the claims are "Currently Amended". Applicant is required to resubmit these claims in their current form (or with any further amendments) with the proper claim status identifier.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4, 6-8, 20, 24, 26-27, 32, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu et al. (5,906,001).

As per claims 1, 8, and 20, Wu et al. teaches in figure 3 a system including a plurality of processors 110, 114, each including a TLB 111, 115, the processors coupled together by a host bus 120 ("main communication network"). A requesting microprocessor changes a PTE and invalidates its own TLB entry corresponding to the changed PTE ("performing an operation on the first TLB..."). See column 7, lines 8-11. A INVPLG instruction is used to invalidate the entry in the requesting microprocessor's TLB (see column 4, lines 58-60), and the INVPLG instruction includes the virtual address of the location to be invalidated ("accessing a virtual address in the first TLB..."). See column 2, lines 20-22. After the requesting microprocessor's TLB is invalidated (step 620, figure 5), the requesting microprocessor issues a TLB flush transaction ("TLB message") on the host bus, where the TLB flush transaction includes a TLB flush transaction request code ("the TLB message comprising an access request") and a data field indicating the page number of the PTE that has changed ("and the corresponding physical address"). See column 7, lines 19-23. The TLB flush transaction is sent on the host bus to the other processors in the system ("sending the TLB message..."). See column 7, lines 19-20. The receiving processor on the host bus determines whether the page number of the changed PTE is

contained in its TLB ("determining, at each of the plurality of processors...if the TLB message affects the address translation data..."). See column 7, lines 24-26.

As per claims 4, 6, 24, and 26, the PTE value in the TLB flush transaction must be compared to entries in a receiving processor's TLB to determine if the PTE in the TLB flush transaction matches an entry in the receiving processor's TLB as set forth in column 7, lines 24-26.

As per claims 7, 27, 32, and 36, Wu et al. teaches that if the PTE in the TLB flush transaction matches a PTE in a receiving processor's TLB, then the entry in the receiving processor's TLB is invalidated. See column 7, lines 27-29.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 9, 11-12, 15, 18-19, 21, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Traynor (6,263,403).

As per claims 9, 12, 19, 21, and 28, Wu et al. teaches the invention as set forth above for claims 1, 8, and 20, however, Wu et al. does not teach an interconnect network having a plurality of independent paths. Traynor teaches an invalidation method in multiprocessor systems that can be coupled together using a ring or crossbar network, which are both independent paths. See column 5, lines 15-17. It would have been obvious to one of ordinary skill in the art to have

modified Wu et al. to include more systems similar to the system of figure 3 coupled together using a ring or crossbar network, as taught by Traynor, because this would increase the number of processors thereby increasing processing capability, while the ring or crossbar interconnection would allow for greater distances between processing element clusters .

As per claims 11, 15, and 18, Wu et al. teaches invalidating entries as set forth at column 7, lines 27-29.

9. Claims 2-5, 10, 14, 16-17, and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. in view of Schimmel (6,105,113).

Wu et al. does not teach updating (i.e. moving) the TLB entry in the other processor TLBs instead of invalidating the TLB entry (updating the TLB entry involves "reading" the TLB entry when snooped and "writing" the new entry into the TLB). Schimmel teaches that is was known to update entries in a TLB instead of invalidating entries. See column 4, lines 5-21. It would have been obvious to one of ordinary skill in the art to have updated the TLB entry in the other processors instead of invalidating the entry, as taught by Schimmel, because updating the entry instead of invalidating the entry would reduce TLB misses in the other TLBs.

Allowable Subject Matter

10. Claims 29-31 and 33-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendments to the claims.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any response to this final action should be mailed to:

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

All "OFFICIAL" patent application related correspondence transmitted by FAX must be directed to the central FAX number at **(703) 872-9306**:

"INFORMAL" or "DRAFT" FAX communications may be sent to the Examiner at **(571) 273-4204**, only after approval by the Examiner.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Fourth Floor (receptionist).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reginald G. Bragdon whose telephone number is (571) 272-4204. The examiner can normally be reached on Monday-Thursday from 7:00 AM to 4:30 PM and every other Friday from 7:00 AM to 3:30 PM.

The examiner's supervisor, Mano Padmanabhan, can be reached at (571) 272-4210.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Reginald G. Bragdon
Primary Patent Examiner
Art Unit 2188

RGB
December 13, 2004